



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/599,993

06/23/2000

Atsunobu Murase

0102/0127

8979

21395

7590

11/01/2005

LOUIS WOO
LAW OFFICE OF LOUIS WOO
717 NORTH FAYETTE STREET
ALEXANDRIA, VA 22314

EXAMINER

BRINEY III, WALTER F

ART UNIT

PAPER NUMBER

2646

DATE MAILED: 11/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/599,993

Applicant(s)

MURASE, ATSUNOBU

Examiner

Walter F. Briney III

Art Unit

2646

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 02 December 2004 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. **Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Romesburg (US Patent 5,966,438) in view of Fujii et al. (US Patent 5,940,499).**

Claim 1 is limited to *an environmental noise level estimation apparatus*. In rejecting this apparatus it is noted that Romesburg discloses a method and apparatus for adaptive volume control for a radiotelephone. See Abstract. In general, the radiotelephone seen in figure 6 of Romesburg includes a microphone (23) that is responsive to a near-end user's voice signal. This signal is sampled periodically and converted to a digital signal by the microphone A-to-D converter (31). After foregoing

Art Unit: 2646

acoustic echo cancellation by way of echo canceller (37), the voice signal is run through a parallel array of elements (36), (38) and (45) that are configured for noise suppression. See column 6, lines 24-52. With respect to the claims, it is asserted that the microphone corresponds to detection means as recited and the microphone A-to-D converter corresponds to the sampling means as recited. Specifically, A-to-D converters inherently provide digital bit/word streams in response to periodically sampled analog signals, where the period is based on a clock signal. Despite these overlaps, it is noted that the disclosure of Romesburg merely provides a suggestion to control a noise suppression operation (36) in response to a noise estimate (38) and does not provide the explicit disclosure required to anticipate the variation detections means and estimation means of the claim. However, because Romesburg does not disclose the details of the noise estimation process or the noise suppression process, one of ordinary skill in the art is inherently motivated to provide operative solutions in order to "fill-in the blanks" and practice the invention of Romesburg.

To that end, it is noted that Fujii teaches a voice switch used in hand-free communications system. See Abstract. With respect to the noise estimation process of Romesburg, Fujii teaches providing noise estimation in accordance with the signal flow of figure 6. In particular, an input signal 'X' is compared to its previous value 'Z' to determine the attack/release rates of the noise estimation filter. This comparison, as performed by comparator (81), corresponds to the variation detections means as recited. Following the attack/release rate determination, the noise estimation filter of figure 6 applies an attack equal to $1-a_n$ to signal 'X' and a release equal to a_n to signal

'Z.' In this way gradual changes in the noise estimate are made in accordance with the comparison. See column 7, line 59, through column 8, line 20.

It would have been obvious to one of ordinary skill in the art at the time of the invention to estimate the noise component of an input signal containing both voice and noise using the noise estimation filter as taught by figure 6 of Fujii because Romesburg fails to fully disclose the operation of such a filter while requiring its presence.

Claim 2 is limited in part to *an environmental noise level estimation apparatus as claimed in claim 1*, as covered by Romesburg in view of Fujii. In rejecting this apparatus, it is noted that when the signal 'X' as denoted in figure 6 of Fujii falls below the previously sampled level 'Z,' the second attack rate ' $1-a_2$ ' is employed to generate the noise estimate. As the value of ' a_2 ' is less than '1' and ' a_1 ,' it follows that the output of the noise estimation circuit closely follows the transitions of the signal 'X.' In other words, the environmental noise level is correspondent to the presently sampled level. Therefore, Romesburg in view of Fujii makes obvious all limitations of the claim.

Claim 3 is limited in part to *an environmental noise level estimation apparatus as claimed in claim 1*, as covered by Romesburg in view of Fujii. In rejecting this apparatus, it is noted that the microphone disclosed by Romesburg does not correspond to a power level detection means. However, the teachings of Fujii suggest using absolute or squared-estimates of the input amplitude, either of which corresponds to a power level estimation. This only makes sense, as the comparison performed in figure 6 should not rely on the phase of the input signal, which is known to vary between a negative and positive peak, but on the instantaneous power of the input signal. See

column 7, lines 51-58. With respect to the sampling means, it is noted that the power estimates of used in figure 6 are generated and then utilized within a CPU, which means they are sampled in response to a clock signal. Therefore, Romesburg in view of Fujii makes obvious all limitations of the claim.

Claim 4 is limited in part to *an environmental noise level estimation apparatus as claimed in claim 1*, as covered by Romesburg in view of Fujii. Romesburg discloses that noise estimates should only be made during periods of near-end silence. That is, where a near-end user's voice is not present within the input signal to the microphone. To this end, Romesburg provides a user voice detector (45) for selectively enabling noise estimates. See Romesburg column 7, lines 54-67. Furthermore, Romesburg discloses that a comparison between the current level of the input signal and a threshold determines the presence of a user's voice. See column 8, lines 1-8. Therefore, Romesburg in view of Fujii makes obvious all limitations of the claim.

Claim 5 is limited in part to *an environmental noise level estimation apparatus as claimed in claim 1*, as covered by Romesburg in view of Fujii. It is noted that neither Romesburg nor Fujii discuss their operational rates. Therefore, Romesburg in view of Fujii anticipate all limitations of the claim with the exception wherein an interval of said clock signal is smaller than 250 msec.

The examiner takes Official Notice of the fact that POTS voice signals were known to be sampled at a rate of 8000 samples per second. This translates into a sampling period that is substantially less than 250 msec. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide analog-to-digital

conversion at a rate of 8000 samples per second (i.e. a period of 125 microseconds) simply because neither Romesburg nor Fujii teach a value and because this rate is the standard rate employed throughout the world.

Claim 6 is limited in part to *an environmental noise level estimation apparatus as claimed in claim 5*, as covered by Romesburg in view of Fujii. It is noted that neither Romesburg nor Fujii discuss their operational rates. Therefore, Romesburg in view of Fujii anticipate all limitations of the claim with the exception wherein an interval of said clock signal is smaller than 200 msec.

The examiner takes Official Notice of the fact that POTS voice signals are sampled at a rate of 8000 samples per second. This translates into a sampling period that is substantially less than 200 msec. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide analog-to-digital conversion at a rate of 8000 samples per second (i.e. a period of 125 microseconds) simply because neither Romesburg nor Fujii teach a value and because this rate is the standard rate employed throughout the world.

Claim 7 is limited in part to *an environmental noise level estimation apparatus as claimed in claim 6*, as covered by Romesburg in view of Fujii. It is noted that neither Romesburg nor Fujii discuss their operational rates. Therefore, Romesburg in view of Fujii anticipate all limitations of the claim with the exception wherein an interval of said clock signal is smaller than 150 msec.

The examiner takes Official Notice of the fact that POTS voice signals are sampled at a rate of 8000 samples per second. This translates into a sampling period

that is substantially less than 150 msec. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide analog-to-digital conversion at a rate of 8000 samples per second (i.e. a period of 125 microseconds) simply because neither Romesburg nor Fujii teach a value and because this rate is the standard rate employed throughout the world.

Claim 8 is limited in part to *an environmental noise level estimation apparatus as claimed in claim 1*, as covered by Romesburg in view of Fujii. Romesburg discloses that noise estimates should only be made during periods of near-end silence. That is, where a near-end user's voice is not present within the input signal to the microphone. To this end, Romesburg provides a user voice detector (45) for selectively enabling noise estimates. See Romesburg column 7, lines 54-67. Furthermore, Romesburg discloses that a comparison between the current level of the input signal and a threshold determines the presence of a user's voice. See column 8, lines 1-8. Therefore, Romesburg in view of Fujii makes obvious all limitations of the claim.

Claim 9 is limited in part to *an environmental level estimation apparatus* that is essentially the same as the apparatus of claim 1, as rejected by Romesburg in view of Fujii. It is noted that the first and second intervals of this claim correspond to the input and output intervals of the noise estimation apparatus as seen in figure 6. Clearly, the output of the noise estimation apparatus is updated for every sample of signal 'X,' which means the output interval agrees with the input interval. Therefore, Romesburg in view of Fujii makes obvious all limitations of the claim.

Claim 10 is limited to *a communication apparatus*. This apparatus differs from claim 1 in that it further comprises a microphone, communication means, reproducing means and volume control means. All of these elements are provided within the framework of Romesburg in view of Fujii. In particular, Romesburg clearly depicts a microphone (23), a communication means (27) and reproducing means (25). In addition, the noise estimate causes the reproduced voice signal to vary in volume by way of variable gain amplifier (34). See column 6, lines 12-22. Furthermore, in accordance with the rejection of claim 3, the detection and sampling means correspond to those elements responsible for determining the absolute or squared magnitude of the input microphone signal and subsequently providing the magnitude value 'X' to the signal processor taught by figure 6 of Fujii. Therefore, Romesburg in view of Fujii makes obvious all limitations of the claim.

Claim 11 is limited in part to *the communication apparatus of claim 10*, as covered by Romesburg in view of Fujii. As seen in figure 6 of Romesburg, the radiotelephone (21) includes an A-to-D converter and a D-to-A converter, which together comprise a codec as recited. Therefore, Romesburg in view of Fujii makes obvious all limitations of the claim.

Claim 15 is limited to *a data terminal apparatus* which is essentially the same as claim 10, as covered by Romesburg in view of Fujii. For clarity, the sound source means of the instant claim appears to correspond to the communication means of claim 10. Therefore, Romesburg in view of Fujii makes obvious all limitations of the claim.

Claim 23 is limited to *an environmental noise level estimation apparatus as claimed in claim 1*, as covered by Romesburg in view of Fujii. Figure 6 of Fujii clearly illustrates that the noise estimate is updated by adding small levels of the signal 'X' to the previous estimate 'Z.' Therefore, Romesburg in view of Fujii makes obvious all limitations of the claim.

Claims 16-22 and 24 are limited to *methods of estimating an environmental noise level* that respectively, directly correspond to the apparatuses recited in claims 1-7 and 23, as covered by Romesburg in view of Fujii. Therefore, Romesburg in view of Fujii makes obvious all limitations of the claims.

2. **Claims 12-14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Romesburg in view of Fujii and further in view of Gerson et al. (Acoustics, Speech and Signal Processing. ICASSP-90. 1990 International Conference on 3-6, April 1990. Page(s): 461-464).

Claim 12 is limited in part to *the communication apparatus of claim 11*, as covered by Romesburg in view of Fujii. Romesburg in view of Fujii fail to disclose the sampling rate and transmission rate of the transceiver (27). Therefore, Romesburg in view of Fujii anticipate all limitations of the claim with the exception wherein said interval is 10 msec to 40 msec.

The examiner takes Official Notice of the fact that wireless transmission was known to often take place in accordance with coded, packetized data samples. While this increases data latency, it decreases processing power, which reduces power consumption, which then influences battery size and cost. A prior art codec and

Art Unit: 2646

packetizer are described in Gerson, page 461. In particular, Gerson teaches providing wireless voice packets with a period of 20 msec, which corresponds exactly to 160 samples from the A-to-D converter of Romesburg. It would have been obvious to one of ordinary skill in the art at the time of the invention to code and group input samples into frames of 20 msec as was known in the art and taught for by Gerson to provide a reduction in processing overhead, which leads to a reduction in overall size and cost.

Claim 13 is limited in part to *the communication apparatus of claim 12*, as covered by Romesburg in view of Fujii. As shown in the rejection of claim 12, the period of for coding and decoding voice is 20 msec. Therefore, Romesburg in view of Fujii and further in view of Gerson makes obvious all limitations of the claim.

Claim 14 is limited in part to *the communication apparatus of claim 13*, as covered by Romesburg in view of Fujii. As shown in the rejection of claim 12, the period of for coding and decoding voice is 20 msec. Therefore, Romesburg in view of Fujii and further in view of Gerson makes obvious all limitations of the claim.

Response to Arguments

Applicant's arguments with respect to claims 1-24 have been considered but are moot in view of the new ground(s) of rejection.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter F. Briney III whose telephone number is 571-272-7513. The examiner can normally be reached on M-F 8am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on 571-272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

WFB
10/24/05


SINH TRAN
SUPERVISORY PATENT EXAMINER